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This handbook is written for use by individuals at the local and state levels, with the ultimate goal of influencing the nature and direction of research in vocational-technical education. The substantive base for the handbook is derived from presentations published in total in "Proceedings: National Conference on Research, 1968 Vocational Education Amendments" which is available as ED 028 300. The handbook is organized around substantive concepts and levels of research. Chapter I examines legislation authorizing research monies. Chapter II and III suggest ways and means to implement research policies on the state and local levels. Chapter IV deals with national problems and issues in research. A checklist for state plan research provisions, suggested procedures for submitting and funding research proposals, examples of research coordinating activities, and an example of a Research Coordinating Unit Budget are appended. (CH)

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Research Handbook for Vocational-Technical Education

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PREFACE

This handbook contains a synthesis of papers presented at the National Conference on Research held February 18-20, 1969, in Oklahoma City. It is limited and reflects the particular perspectives of the specialists who presented the original papers. But the final draft of the handbook is also general in that it is the product of several revisions based on reactions of selected audiences who represent various segments of vocational education, both private and public. Hopefully, it is forward looking in design and substance.

The project staff acknowledges the assistance of many individuals. Initially, eight consultants were engaged to develop position papers on research in vocational education. The major ideas in these papers form the substantive base for the handbook itself. The consultants presented their ideas at a national meeting. The presentations are published in total in *Proceedings: National Conference on Research, 1968 Vocational Education Amendments.* Selected participants representing all facets of vocational-technical education, from both public and private sectors of the economy, reacted to the presentations. From this interaction members of the project team developed the first draft of the handbook. The first draft was taken to nine regional clinics where participants from State and local vocational-technical organizations reacted to the format and content. The handbook was then revised to its present form. Suggestions from letters written by participants at the national conference have been used freely throughout the handbook. Special credit goes to the Florida State Department of Education for helpful policy statements on research.

It is the ultimate purpose of this handbook to influence the nature and direction of research in vocational-technical education. It is presumed that much research effort in the future will be directed toward local and State projects. Consequently, the handbook is written for use by individuals at the local and State levels.

Hopefully the handbook contains alternative strategies for developing research policies. It is intended to be a collection of ideas, some of which

are more appropriate than others in particular circumstances. It becomes the task of the reader to determine which strategy or approach has the most merit for his particular situation.

The format of the handbook facilitates use by the reader. The chapter headings are organized around substantive concepts and levels of research. Chapter I examines legislation authorizing research monies. Chapters II and III suggest ways and means to implement research policies on the State and local level. Chapter IV deals with national problems and issues in research.

In addition to the chapter divisions, the reader can obtain a brief overview of the content by referring to the "Guiding Principles" identified under each chapter heading. The reader who is interested in how-to-do-it suggestions may refer to the "Specific Recommendations" section at the end of each chapter.

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CHAPTER 1

Research: A Legislative Mandate

Guiding Principle

A commitment to the research and development function should be institutionalized into the operations of State agencies. State monies should be budgeted to the R and D function at a sufficient level to continue program innovation regardless of the Federal research funds allocated to the State.

Public Law 90-576 continues the spirit of research in vocational education initiated by Public Law 88-210. Part C of P.L. 90-576 sets forth provision for research and training in vocational education. Procedures for application of Federal funds are spelled out. However, 50 percent of the funds available for research are set aside for distribution directly to State boards of vocational education. This provision places responsibility on state-level personnel for maximizing benefits from these funds. Allocating research monies to the States which will be dispersed at the State and local level also implies new and different objectives for research.

The traditional view of research sees the research process as one of generating new knowledge and of revising generally accepted conclusions in light of new evidence. The university researcher explores theoretical considerations in an attempt to project in a somewhat sophisticated and systematic manner the outcomes of any given research study. This type of research will tolerate negative results. In other words, if the projected conclusions are not substantiated and the study is well-conceived and appropriately designed, then these findings are related back to theoretical considerations for revision. Such an approach has been used in many graduate student dissertations.

P.L. 90-576 intends for state-allocated research monies to be used for program revision. This intention may have been the result of comments criticizing research during committee hearings. The panel of consultants on vocational education suggested that vocational education research falls

far short of meeting the current need. Prior to 1963, research had been carried out primarily by graduate students. Even after the 1963 Act, research had little impact on the program development.

The 1968 Advisory Council on Vocational Education mentioned genuine concern at both State and Federal levels about the nature and value of research. The inability of research to find the needed answers to point the way has been most disappointing. The most frequent criticism of research has been the lack of tangible evidence of its impact on vocational programs. Perhaps this is the reason that Public Law 90-576 places emphasis on dissemination of information and the development of innovative programs. The need for relevance of research to program planning places a great challenge on State directors of vocational education to ultilize research monies in such a manner as to effect program change.

A Functional Definition of Research

For the purposes of this handbook research is conceived in its most generic sense, as a function — a function of program planning and development. In this broad sense research proposals must consider not only the rationale for the need for the project but the potential implementation of the findings as well. The research process can assist in (1) setting objectives, (2) developing procedures to reach those objectives, and (3) thoroughly testing products such as curriculum materials before they are disseminated for use in educational systems. This view conceives research not as a narrow, discipline project-oriented activity but rather as a broad function of the educational system itself. The objective or goal of this function is to facilitate change and improvement in vocational-technical education. Obviously there is a need for continuing change and improvement; therefore, the goal becomes a part of each new plan or idea which is proposed.

Educational systems can learn much from private industry. Industry permits other sectors of the economy to stand most of the cost of researching phenomena which have a limited probability of yielding profit-making information. Industry prefers to concentrate on applied rather than basic research and on the development of an improved product for service to its consumers. Such mission-oriented research will account for approximately 69 percent of the industrial research and development work in 1969. This pragmatic view may contain a lesson for vocational-technical education researchers. State departments of education and directors of vocational education can ill afford research which does not relate to existing or anticipated needs in the State. Consequently it appears logical to channel these research monies into programs and projects which will result in efficient and effective approaches to teaching and learning.

These programs and projects should be able to draw on more basic and perhaps developmental research of colleges and universities. State-level programs and projects should relate to a national network of coordinated effort in order to maximize results.

Legislative Authorization for Funds

Like the 1963 Act, Public Law 90-576 authorizes 10 percent of the appropriations to be spent on research. The Senate committee reinforced this intent by declaring that the section of the Act "designed to support vocational education research is to be the leading edge in vocational education." Part C of P.L. 90-576 authorizes 50 percent of the research monies to be made available to the States for each of the following purposes: (1) for payment of up to 75 percent of the cost of the State research coordinating unit; (2) for grants to colleges and universities, other public or non-profit private agencies or institutions, and local educational agencies, and for contracts with private agencies, organizations, and institutions. These funds may be used to pay up to 90 percent of the cost of programs and projects for the following purposes: (1) research and training programs; (2) experimental, developmental, or pilot programs; and (3) dissemination of information from research and demonstration programs. A more specific statement of these purposes may be found in P. L. 90-576. The remaining 50 percent of the research monies may be dispersed from the U. S. Office of Education for projects which demand national coordination of activities and have national or regional implications. In addition to Section C of P.L. 90-576, a search of the Amendments reveal the following relevant sources of continuing funds available at the State level for research and related purposes.

Section 122(b) 2 and 3 deals with evaluation and with obtaining information about current and projected manpower needs and job opportunities; Section 122(a) 8 is concerned with evaluation and development activities as a part of ancillary services.

The State will have under its control terminal funds authorized by the following sections: Section 142(d) supports the development, establishment, and operation of exemplary and innovative occupational education programs and projects; Section 161(b) 2 includes curriculum development, evaluation, and research and demonstration activities in homemaking education; and Section 173(a) 4 and 8 provides for curriculum development and evaluation in cooperative programs.

In addition, the Commissioner, USOE, will retain certain research-related funds available for awards to institutions and agencies, irrespective of their geographical source. These authorizations include: Section 142(c), exemplary programs and projects; and Section 191(c), curriculum development.

What conclusions can be drawn regarding the intent of the program of research? First of all, *members of Congress continue to place a high value on research in vocational and technical education.* Although appropriations have not measured up to their authorizations, their priorities for research are, nevertheless, substantial. Secondly, *members of Congress are aware of the problems of staffing for research, a recurring theme in both the Senate and the House Committee Reports.* Thirdly, *they want research to contribute to existing programs as well as to new programs and new emphases.* Finally, *they want the research programs to be a part of plans generated at local and State levels as well as at the Federal level.*

National Priorities for Research and Development

National priorities have been set by Congress. Research has become one of these. The built-in system of evaluation on a 5-year basis emphasizes the need for data collection, processing, and interpretation. The evaluation function requires staff members with some knowledge of research procedures.

Research and development as a function of program planning relates directly to needs of society as interpreted by Congress. The 1968 Amendments list a number of goals or objectives for the educational system. Among these are the following:

1. There is need for all persons to have "access" to vocational education. This includes people of all ages in all communities with various interests and abilities.
2. Advisory councils have been mandated as a device for relating the educational system to community demands. Advisory council members may need to be informed of research roles and priorities. Evaluation is a constant thread through the 1968 Amendments. Congress intends for vocational education to be a quality program. Data collection and its interpretation become important functions for program planners.
3. Residential vocational schools are urged as a device for coping with youths who need employment skills.
4. Cooperative education programs are viewed as a bridge between a student's academic preparation and realistic experience in the world of work. As such, cooperative education becomes a priority item for vocational education research.

To summarize, research is viewed as a national priority primarily because of what it can do for the other aspects of the vocational program. In its narrowest sense research can be evaluation, which leads to a restructuring and a pinpointing of problem areas in vocational education. In its broadest sense research is systematic change, an attempt to supplement and develop different approaches to solve vocational education problems. This latter rationale develops an approach which results in the

adoption of different methods into an existing target system. This approach requires emphasis on dissemination of information, on repackaging of research findings, and upon change agents to assist users of the repackaged information.

All organizations must be willing to look at alternative ways of achieving their goals if they are to remain pliable and dynamic. Research can provide the procedures for testing alternative solutions to problems.

Specific Recommendations

1. State and local educational agencies should not impose eligibility requirements in research programs which are in addition to Federal law.

2. Funds for research should be allocated to the States on a general non-categorical basis.

3. P.L. 90-576 stipulates that state-allocated research monies are to be used for making qualitative improvements in existing programs.

4. State-level programs and projects should relate to a national network of coordinated research effort to maximize results.

CHAPTER 2

State and Local Administration of Research Funds

Guiding Principles

Administrative policies at all levels should be minimal yet sufficient to allow an accounting of funds.

Users of research findings should participate in the process of determining priorities for research and development activities.

Decisions on research priorities should be made at the administrative level (local, State, or Federal) responsible for funding.

The continuing evaluation function should be clearly separated from program development in vocational and technical education. An element of evaluation expertise from outside the system should be present in program evaluation.

The administration of research funds as expressed in the State plan should contain an accurate and explicit statement of relationships among research agencies and funding procedures. The State plan should provide opportunities for alternative strategies and ways of adjusting solutions to fit different situations. The plan needs to be decision-oriented and directly involve research funding units with program planning units.

An approach of this type requires a commitment of resources to the research function regardless of the level of Federal funds. Congress has been explicit in its desire for educational agencies to maintain research and development activities. Two successive Acts have allocated 10 percent of authorized program planning funds for research. Hopefully, State agencies and local school systems will see the wisdom of following these same procedures.

One strategy is to commit a certain percentage of State funds each year to the research function. A research commitment should be reflected in the vocational-technical programs at the local level. Perhaps some incentive could be awarded to local school systems for successful practices which were not in existence the previous year.

A Model for Research and Development

In the last few years several theories and models have been proposed in order to explain the nature of the activities required to help insure

rapid, qualitative improvements in education. Figure 1, "Educational Change Model,"[1] illustrates one version of a generalized abstraction of the change process; it draws heavily upon the prior work of Guba and Clark.[2] Figure 1 (page 24) has been used as the major resource for identifying the kinds of functions to be performed by the research-related subsystem. The suggested functions are briefly described below. Each is required in order to facilitate change by exploiting the creative potential of individuals and groups, and by serving directly the ongoing needs of the occupational education system.

(a) Conducting operational research to provide special information immediately useful in decision-making or knowledge immediately applicable in the operating program.
(b) Developing new and updating existing curriculums and instructional materials to increase the scope and improve the relevance and efficiency of occupational programs (the "normative" development process of engineering and producing "standard" types of curriculum products).
(c) Evaluating the effectiveness of occupational education programs including: (i) the extent to which certain pilot-experimental programs are attaining their goals (formative evaluation), (ii) the cost/effectiveness of alternative ways of providing occupational instruction (periodic, summative evaluation at the micro level), and (iii) the total impact of the occupational education program in relation to societal needs and goals (periodic, summative evaluation at the macro level).
(d) Stimulating, facilitating and coordinating the innovative research and development efforts of individuals and groups.
(e) Inventing, engineering, producing, and evaluating prototype innovative curriculums and instructional materials.
(f) Conducting applied research on methodological, continuing, and complex problems which have potential for making long-range and general qualitative improvements in occupational education.
(g) Administering research-related grants and contracts with agencies and institutions in order to monitor and supervise the ongoing research-related activities supported by state-controlled funds.
(h) Disseminating the results of research-related activities to: (i) facilitate further research and development, (ii) improve the rationality of educational decision-making, and (iii) speed the application of new knowledge and the adoption of worthy innovative practices.

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[1]Moss, Jerome, Jr., *The Evaluation of Occupational Education Programs*, Technical Report, 3, Minneapolis, Research Coordination Unit in Occupational Education, University of Minnesota, September, 1968, p. 14.

[2]Guba, Egon and David Clark, "An Examination of Potential Change Roles in Education," Paper Presented at the N.E.A. Conference on Innovation in Planning School Curricula, Airlehouse, Virginia, October 2-4, 1965.

(i) Coordinating and conducting training activities designed to increase the number and improve the competence of producers and consumers of occupational education research-related activities.

It should be noted that the suggested functions deliberately exclude the conduct of basic research. That is, all the problems to be researched by the subsystem should emanate from the parent occupational education system, and the results should have recognizable potential applications to that system. Demonstration, trial and adoption, as shown in Figure 1, represent the transitional stages which link the research-related subsystem with the operational subsystem.

All of the nine functions in the above list are necessary to the systematic improvement of occupational education practice. The research-related subsystem expressed in each State's long-range plan must provide for the efficient performance of all nine functions. And the implementation of the long-range plan, as revealed by the activities and budget of the annual plan, must give them substance under specific conditions.

Operational Definitions for Research and Development

The 1968 Amendments, P.L. 90-576, list several terms in Part C. Among them is the term *experimental programs* as contrasted with developmental and pilot programs. It is important to recognize that an experimental program is a type of research. The experimental elements may be materials, techniques, processes, or combinations of these. Like other forms of research, experimental programs will tolerate negative results. Consequently, evaluation of experimental programs is imperative.

Developmental programs differ from research by the fact that outcomes are known and describable. The objectives may be stated in the form of performance specifications. Developmental projects or programs produce materials or demonstrate techniques which will accomplish prespecified objectives. Unlike experimental research, developmental projects may change objectives. Ultimately, positive results must occur.

The object of a *demonstration program* is dissemination, and the test of its effectiveness is the extent to which it provokes the development of similar programs. In another sense, a demonstration program may be created to determine whether its materials, techniques, or processes can accomodate to a new or different setting.

Dissemination refers to activities which assist people in finding what they are looking for and activities designed to inform professionals about improved practices in their respective fields. Dissemination activities should be specific to the ordinary ways in which professionals seek, obtain, and utilize information.

There is obviously much need for coordination of information from various sources. Vocational and technical education requires inputs from the Department of Labor, the many areas of HEW, and local school statistics. Most public school systems are not in a position to coordinate this information. Consequently, it becomes the responsibility of the State to develop a system not only of information processing but a system of agency interrelationships which insures minimum levels of self-renewal. Each State has different constraints and limiting circumstances. This publication attempts to provide alternative suggestions for organizing State and local agencies.

Relating Research Functions to State Agencies

At least three broad funding categories for research activities are identified in P.L. 90-576. The first of these is research and training, which includes the production of research data and an orientation of people to these methods and information. The second category includes experimental, developmental, and pilot programs. (In experimental programs, negative results are acceptable and the information adds to the store of knowledge. In developmental and pilot programs, however, relatively successful outcomes are expected.) A third category is dissemination of information which clearly includes those ideas which will work. The objective of dissemination is adoption by the target system.

These three categories closely resemble the functions of research listed earlier in this chapter. At this time an attempt will be made to relate most of the earlier functions to agency responsibilities. The reader should keep in mind the perspective of research as a means to program revision and innovation. The research subsystem undergirds the whole of vocational-technical program planning.

The Planning Function: Perhaps the most critical ingredient in administration of any educational program involves planning. This includes the setting of goals or objectives, identifying alternative procedures or strategies to reach those objectives, and developing a set of attitudes or expectations for outcomes of programs. This latter statement relates to the category entitled normative development. Advisory committee members should represent the users of research information. In many cases these users will be practicing vocational or technical educators. Such individuals should have some knowledge of the substantive problems within a given vocational or technical discipline. Individuals participating in the planning process must draw on data and information from many sources, including several other State agencies. Consequently, relationships between organizations must be devised to communicate facts about employment needs and the supply of high school and college graduates to planners of

education programs. Most likely the agency planning vocational-technical programs is located under the jurisdiction of the State Board for Vocational-Technical Education. This agency should be engaged in continuous self-evaluation of the system. Initially, serious gaps in information are likely to be discovered. These voids should be communicated to the agency responsible for setting research priorities. Research or developmental projects may be solicited if critical information is needed. A host of operational research questions should be generated from the program planning agency in the organization.

The Evaluation Function: A second primary function associated with vocational-technical program administration is the evaluation of existing programs as well as the evaluation of innovative programs and expenditures of resources for these programs. Regardless of the quality of program, almost any organization can profit from periodic in-house subjective evaluations. In addition to self-evaluation, objective reviews of existing programs should be required. Several States are initiating program reviews which will result in recommendations for change. People serving as evaluators may come from a number of sources, from other school systems, from state-level agencies, or, as consultants, from universities. It becomes important to divorce the evaluation of programs from the planning stage of development. This separation enhances freedom from biases. Both planning and evaluating activities need to be conducted in an objective atmosphere.

The Funding Function: A third function of research in vocational-technical education evolves around the administration of research funds. Such administration should be designated for a particular agency of State government. It involves a host of related support activities.

One of the most important related activities involves the *setting of priorities* for research programs and projects. This process is similar to the goal-defining objectives of program planners. It must receive the careful consideration of top-level staff personnel. Aiding these people may be an advisory committee. Such a committee could be a subcommittee of the state-wide advisory committee. If such a group is used, it should include representation from the following groups: vocational teachers, private industry, labor unions, non-profit industrial educational concerns, and other users of the research findings. This committee would make recommendations to the policy-making State Board for Vocational Education.

A second responsibility in the administration of research monies involves the *act of budgeting* on the basis of a five-year plan. The first step in the budgeting process is to estimate the approximate number of activities which can be performed by one staff member. The average cost of supporting these activities can be determined. The second step is to decide

on the relative amounts of activity required by each function in accordance with the perceived long-range needs in the State. This determines the approximate level of activity, staff size, and the annual cost that should be designated to each function for the system. Prior experience with research organizations is invaluable in estimating needs and making annual projections of activity within the State.

Funding Research Priorities

It is possible for States to commit from each fiscal year's funds enough money to cover the total reimbursement expenses of each approved project. Since many projects will extend beyond a given fiscal year, this practice may result in leaving unexpended (but committed) funds in each fiscal year. It seems more efficient for the State, therefore, to commit funds only to one year's activity of each approved project and to approve enough projects to utilize all the money available to the State for that year. This practice reduces the financial security of each project, but it enhances the management options available to the State. The recommended practice also requires that (a) project proposals be carefully budgeted by fiscal year, and (b) that the State take into account the expected continuing costs of approved projects when building the annual program plan and budget. The tables in Appendix D may be helpful to those who must plan the research budget.

Several different methods of providing funds for conducting research may be used. Funds may be provided through a contract or a grant. Contracted research is an agreement to pay a specified amount of money upon delivery of a specific body of material provided that body of material meets the approval of the funding agency. Contracts may be written on a (1) cost-reimbursable, (2) a cost-plus, or (3) a fixed-price basis. A research grant provides an individual with resources to pursue a particular line of endeavor. While a final report is required, the payment of funds is not contingent upon any predesignated outcome of the research.

Ordinarily *project support* would be the logical way of obtaining results from research monies defined over a time dimension. Projects have specific objectives and attempt to obtain a specified outcome using a given amount of resources. The project terminates at the end of the grant or contract time. Short term projects may provide incentive for a school system to integrate new ideas into existing programs.

The 1968 Amendments identify another type of support, *program support*. This approach permits the maximum choice of alternative strategies by researchers during the course of the inquiry. It allows for changes in emphasis due to unforeseen circumstances by staff members. This is the type of support solicited by research and development centers.

A State should determine its needs for programatic funding of research. This involves assessing ongoing staff capability at the State level for developing proposals, for conducting ongoing research, and for dissemination efforts. In a State where several institutions and agencies have experienced, proficient researchers, the state-level agency may concern itself primarily with coordination and dissemination of research. Conversely, a State with a low population of researchers might need to have staff personnel concerned with actually conducting research studies in vocational education. Hopefully, the staff load can be reasonably small. Most State agencies should be in a position to contract some of their work of evaluation and project appraisal and review to individuals located in school systems throughout the State.

Likewise, projects and programs should be set up on a priority basis so that three categories for funding evolve: (1) the solicited category, (2) a second category which earmarks funds for specific areas, and (3) the non-earmarked category which would be used to fund proposals on their own merit. Some States have designated a very small amount of money exclusively for vocational teacher use in research. These have been called "minigrants" strictly for the development of a creative idea. When funds are available, these proposals could be processed with a minimum of red tape.

Local education agencies need a clear statement of the procedures to be used for funding research proposals. Hopefully, the applications for State research funds contain local plans for research and development. These plans identify research programs, activities, and services deemed necessary by practitioners in local education agencies. State research agencies should be in a position to advise local superintendents of schools on how to proceed in submitting an application for funds. Also, representatives of the state-level agencies must attempt to stimulate inquiry into improved practices in vocational-technical education.

Stimulation of Research Effort

Many different approaches might be made for stimulation of research effort:

1. A general announcement of the availability of State monies for research and development in the local school system should be published. Perhaps this publication would take place in a newsletter or other house organ of the State education agency.
2. Representatives of the State agency should participate in teacher-group meetings, such as annual conventions and State teachers association meetings. Frequently during informal conversations, ideas will be expressed for improvement of vocational-technical education.

3. Representatives from professional teacher organizations can be assembled to advise on teacher-conducted research projects. This technique could be useful in promoting research.
4. Workshops or seminars might be conducted by the state-level agencies in various regions throughout the State. This would serve a twofold purpose: first, to inform local educational agency administrators of the availability of research monies; and second, to act as a brainstorming device for ideas to improve the profession.

After the idea has been planted or received, adequate procedures need to be available for *processing research applications*. It is recommended, at least in the initial stage, that an abstract form of the proposal be prepared and sent to the State agency responsible for review. An example is in Appendix B. If the abstract deserves more attention, it should be returned to the local educational agency together with instructions for making a more complete proposal. This complete proposal, when received by the State agency, should be sent to field readers who may be knowledgeable research persons in the subject matter field of the proposal. The field readers should be paid for their analysis. Assuming a well-written proposal, the degree of congruency between the proposal's objectives and state-level priorities should become an important criterion for funding the proposed investigation.

Most local educational agencies, except for urban school systems, will have only a very limited number of teachers who are knowledgeable in research procedures. Consequently, it becomes necessary for the State educational agency to lend a great deal of support and advice in the preparation of adequate research proposals. It should be noted that such consulting services require allocations of resources, both staff time and money. An effort should be made by the persons devising research priorities not to overlook any geographic area of the State. All school systems need to be aware of the use of research procedures to improve operational vocational-technical programs. Consequently, each school should be in a position to submit research proposals for one priority or another.

Specific Recommendations

1. Public Law 90-576 authorizes 10 percent of the Federal appropriation for vocational education to be spent on research. State and local plans should also make a continuing research commitment to vocational education.

2. Consideration should be given to the transfer of funds from Part B to Part C for the support of research when necessary.

3. An advisory committee should be organized to recommend priorities for research project funding. The committee should be composed of representatives of business and industry, professional vocational-technical teachers, representatives of other State agencies concerned with vocational-

technical education, and others. It may function as a subcommittee of a state-wide advisory council.

4. An inventory of research expertise within a State at varying levels of proficiency should be completed as a first step in identifying individuals who may participate in research activities.

5. State advisory councils on vocational-technical education should be invited to review research and development activities within vocational education.

6. Periodic review of the research and development function in a State should be made by knowledgeable people from outside the system.

7. Research Coordinating Units external to the State Department should have a written agreement relating to their function in State research management.

8. Staff positions in the State research agency should be identified by job descriptions.

9. State agencies, such as the Research Coordinating Unit, should contract with institutions both in-state and out-of-state for specialized assistance. This should be done rather than maintaining staff all year for limited projects. Such institutions as private research agencies and universities could furnish specialized assistance on a contract basis.

10. The administration of research funds as expressed in the State plan should contain an accurate and explicit statement of relationships among research agencies and funding procedures.

11. A clear statement of funding procedures for local research programs and projects should be distributed to all local education agencies in the State.

12. State application procedures should make proposal preparation less of a burden at the local level by first accepting and reviewing abstracts of the proposed project or program.

13. The State research agency should lend much support and advice in the preparation of adequate local research proposals. This statement of support should be distributed with the funding procedures.

14. A review committee should have permanent and ad hoc membership. The permanent membership should be representative of the State research agency and well-qualified members of the research community. The ad hoc membership might be vocational administrators, subject area specialists, teachers, industrial representatives or resource people from other agencies as the nature of the proposal indicates.

15. Applications approved should require periodic progress reports. Projects or programs not progressing as planned should be assessed and terminated or recycled in order to fulfill, at least in part, objectives set forth in the application.

16. Proposal review teams could also carry out evaluation in their respective areas of competence. This procedure would cut down on full time staff needs in the State research agency.

17. Close alliance should be established between the information system, the State library service, and the research coordinating unit.

18. All projects funded at the State and local level should relate to

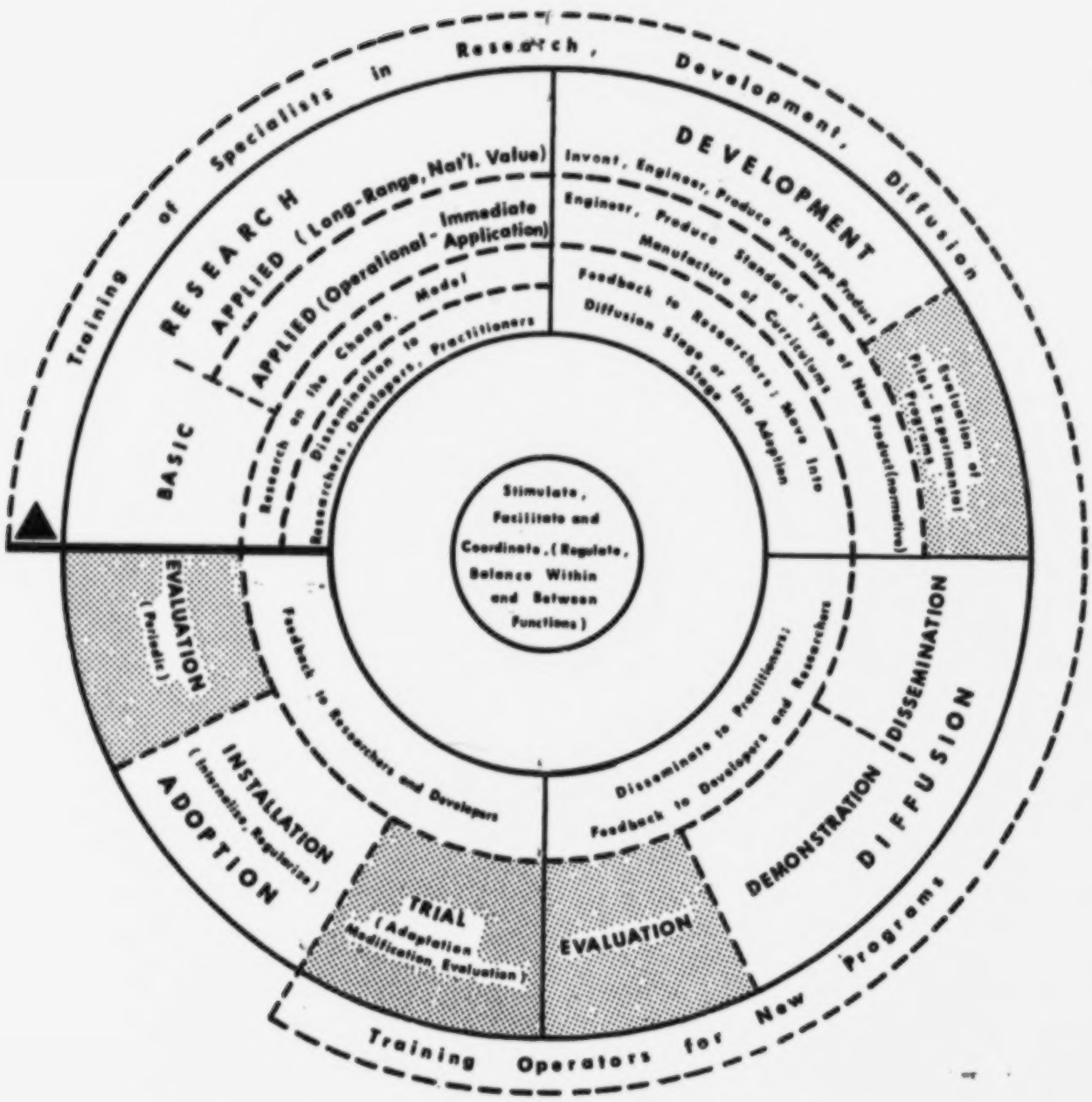
problems emanating from the parent occupational education system and the expected results should have recognizable potential applications to that system.

19. Projects designated as "demonstration" should be designed to advocate program results to interested school systems. When used for such dissemination purposes, the criterion for evaluation should be related to the effectiveness of the dissemination efforts as well as to the effectiveness of the program in attaining its substantive objectives.

Figure 1

EDUCATIONAL CHANGE MODEL

(Read Clockwise)


Training of Specialists in Research, Development, Diffusion
BASIC RESEARCH
APPLIED (Long-Range, Nat'l. Value)
APPLIED (Operational - Immediate Application)
Research on the Change Model
Dissemination to Researchers, Developers, Practitioners
DEVELOPMENT
Invent, Engineer, Produce Prototype Product
Engineer, Produce Standard - Type of New Product(normative)
Manufacture of Curriculums
Feedback to Researchers; Move into Diffusion Stage or into Adoption Stage
Evaluation of Pilot - Experimental Programs
Stimulate, Facilitate and Coordinate, (Regulate, Balance Within and Between Functions)
EVALUATION (Periodic)
Feedback to Researchers and Developers
Disseminate to Practitioners
Feedback to Developers and Researchers
DISSEMINATION
INSTALLATION (Introduction, Regulation)
ADOPTION
TRIAL (Adaptation Modification, Evaluation)
EVALUATION
DEMONSTRATION
DIFFUSION
Training Operators for New Programs

CHAPTER 3

Coordination and Dissemination of Research Findings

Guiding Principles

The most frequently used source of information is the one most accessible to the user.

The research and development functions cannot be performed unless personnel have the expertise necessary to perform their duties.

A technical information system should provide a variety of outputs aimed at different target audiences.

Person-to-person communication is preferred among practice-oriented groups.

Private industry plays an important role in disseminating information to educational practitioners.

Little improvement in vocational-technical education can occur unless practitioners are aware of alternative approaches to education. Developing an awareness of innovative practices in vocational-technical education becomes one of the major goals of a dissemination system. Dissemination and the follow-up steps of implementation should be a concern of each research project which is funded from Section 131(b) of P.L. 90-576. Research which attempts to influence policy and practices must always be aware of the ultimate application of findings to program planning.

Applying research findings to viable programs of vocational and technical education requires channels for communication. Organizations should be structured to facilitate the interaction of component parts. The degree to which these parts are interrelated and processes flow fluently from one part of the organization to another determines its overall efficiency and its effectiveness. Change in one part of the system has implications for other subparts. Thus, if a school superintendent initiates a cooperative arrangement with industry in one vocational program in the school system, he should expect it to have an effect on other programs in the school.

To some extent organizations adapt and adjust to change in much the same manner as individuals. Everett Rogers describes the adoption

process as a specialized kind of decision-making in which the rational adopter goes through five stages:[3]

Awareness, in which the potential adopter learns of the existence of one or more new alternatives to his current practice.
Interest, in which he seeks out more information about the innovation.
Evaluation, when he makes an 'in-the-head' assessment of the innovation.
Trial, when he actually tries out the innovation on a limited basis.
and *Adoption,* when he begins full-scale, operational use of the innovation.

Potential adopters rely on different information sources during the various stages of adoption:

Awareness usually comes from the mass media.
Interest calls for interpretive information from other, more innovative practitioners or from special interpretive or integrative documents.
Evaluation calls for heavy reliance on interpersonal communication.
Trial also involves much interpersonal communication, but recent evidence suggests that special printed analyses of information are important in trials conducted in organizational settings.

Organizational change is more complicated than in the case of an individual. There must be agreement on group goals from several parts of the subsystem. The degree of cohesiveness or lack of it influences the rate of adoption within an organization and the general climate towards change. All of these factors tend to inhibit or enhance the likelihood of an innovation being accepted into any organizational system.

A Technical Information System

"Technical information" as used in this discussion is meant to denote research and research-related data necessary to the planning and decision-making processes in vocational-technical education. This definition may be contrasted with a more global concept of library information in general.

The technical information required in order to adopt a new idea becomes an important ingredient in any recommendation for change. State directors of vocational education interested in maintaining a climate of flexibility should be interested in developing a multi-level technical information system. Hopefully, such a system would extend beyond vocational-technical education. It would be aimed at educational improvements and be designed to make information available to educational decision-makers. Such a system can bring four benefits to education.

1. It provides a basis for more rational problem-definition, policy formulation, and decision-making.

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[3]Rogers, Everett, M., *Diffusion of Innovations,* The Free Press, New York City, 1962, p. 367.

2. It provides intellectual resources for implementation of such policies and decisions.
3. It gives access to specific information required for performance of continuing educational operations.
4. It provides verifiable, reproducible information of use in evaluating program operations.

In developing an information system at any and all levels the following principles need attention: (1) An effective information system must provide a variety of output not only for different segments of the user group but for the same person at different stages of his work. (2) The most frequently used information is the source closest and most accessible to the user, regardless how good or bad he perceives the quality of the information provided; consequently, any system being developed must provide information which is accessible to practitioners of vocational education. (3) Person-to-person communication is the preferred and most frequently used source among practice-oriented groups.

Since people prefer to interact with other people, a technical information system should have human components who contact the user. The system must provide a variety of products tailored to the needs and characteristics of the user population.

The most obvious product from a technical information system is documents, including technical reports, case studies, etc. A second type of product could be interpretable data such as fiscal and pupil data for use in reports and record keeping. In addition to these two outputs, a number of derived products could be developed such as a bibliography or a list of sources of information relevant to a given topic. A technical information system needs tools with which to work. One access tool is the index intended to assist the user in searching through the system. Another access tool is the abstract, which allows the user to determine the relevance of the material without reading the entire document.

The ERIC System

Technical information systems are being developed at various levels. At the national level a number of projects are attempting to construct national information systems. Perhaps the best known national system in vocational education is the Educational Resources Information Center (ERIC) Clearinghouse located in the Center for Vocational and Technical Education, Ohio State University. This system disseminates research findings of both discipline-oriented and mission-oriented research. *Abstracts of Instructional Materials in Vocational and Technical Education* (AIM) and *Abstracts of Research and Related Materials in Vocational and Technical Education* (ARM) are published by the Clearinghouse at Ohio State University. *Research in Education* (RIE) is a publication of Central

ERIC. All three publications furnish indexed abstracts of vocational education research.

The Center at Ohio State University has established an Ad Hoc Committee on Dissemination composed of Research Coordinating Unit representatives from the States of California, Kansas, New Jersey, North Carolina, Oklahoma, and Wisconsin. This committee has developed a publication, *A Guide for a State Vocational-Technical Education Dissemination System*. This publication, when made available from the Center, will serve as an excellent guide for States in establishing an information system. Selected States will use these materials on a developmental basis to establish State information systems. These State systems will be an extension of and completely compatible with the National ERIC system.

In addition, interpretative materials are being developed by the American Educational Research Association through the *Review of Educational Research* and by the National Educational Association through the publication series *What Research Says to the Teacher*.

Also noteworthy is the national dissemination efforts of Phi Delta Kappa with its School Research Information Service (SRIS). At the regional level the Michigan-Ohio Regional Education Laboratory has developed a model for referring information to national systems. However, at the present time the model is not yet complete for all of education.

Information Services for Users

If a technical information system is to be useful to vocational-technical education, the State education agency must become the essential switching point between local schools and national resources. This demands that every State set up a technical information center equipped with access to national document collections and research tools. In the absence of a comprehensive system, perhaps a vocational-technical information program could be set up as a pilot operation within a State. Ideally, this technical information center would be located within the Research Coordinating Unit. Closely allied with the RCU should be a program of library services within the Department of Vocational-Technical Education. The library services should act as a depository for curriculum materials and other documents which might be used by vocational-technical personnel within the State. Research Coordinating Unit members should be in a position to foster improved user services of the technical information system.

A network of interrelated responsibilities among State agencies could become a prerequisite for a comprehensive technical information system. It appears that university scholars and researchers are not in a very good position to disseminate their findings to the practitioner. Yet, the university system should be linked to the program planning branch of State depart-

ments of education and/or vocational education. Personnel from a state-level agency should have a liaison responsibility for interpreting national and university research results to vocational and technical teachers within a State.

The dissemination of results from one part of the system to another may require different abilities from different kinds of people. In other words, a vocational educator who is interpreting research information through mass media for lay consumption would need to package the information very differently than a vocational educator who was attempting to get teachers to adopt an innovation in their local school system. The concept of differential staffing has become important to the teaching function in most universities. Very likely the same concept should be considered in staffing for research and development.

A summary review of an information system's purposes can be stated rather precisely. There are at least three ways in which vocational education can use such a system in the State. First of all, *it might be used to define information needs more clearly. This service requires a human being between the system itself and the user requesting the service.* It is very important that two-way negotiations take place. Secondly, *the system may be used to formulate a search strategy in attacking the problem.* Potential users may review approaches to problems taken by other people as they are listed in the technical data which is the output of the information system. Thirdly, *a review of data in the system may refer the system user to other sources of information which could prove valuable.*

However important a technical information system, it is but one link in a chain of components which are designed to stimulate and foster innovative practices. Up-to-date information is critical to innovation. An open attitude and a willingness to change on the part of employees in any institutional system may become essential factors in adoption. The machinery for translating research findings into a program plan requires much coordinated effort and a clear delineation of responsibilities among agencies.

A technical information system should be *linked with individuals in school systems* who have primary responsibility for curriculum innovation and improved teaching practices. These persons in local educational agencies may be the contact point for disseminators of research findings. The literature is abundantly clear on the need for different types of information at different stages of the adoption process. It is conceivable that a state agency may employ different types of information specialists to assist a school system in their consideration of unique approaches to vocational-technical education. These people in effect would become catalysts attempting to revise program operations continuously. Some authorities would classify them as change agents. They might be located

in districts within a State or centrally located in a State office.

Dissemination and Innovation

One state-level agency should be given responsibility for coordinating the dissemination of research findings. This agency would act as a depository for State research findings and as a request channel for information on national projects. This information would originate from different sources within the State and from relevant projects outside the State. Staff members in this agency would attempt to glean university research findings for practical information related to the planning of vocational-technical education. Personnel in this agency would rewrite some of the technical findings to make them more clearly understood by educational practitioners and decision-makers. Other personnel from this agency would be responsibile for visiting personnel in local school systems who appear to be interested in a particular vocational-technical program innovation.

This extended effort would require much coordination between this agency and in-line staff members of the State board for vocational-technical education. Supervisors of vocational-technical education would need to be informed and agree with the proposed changes being made in the current systems. Also members of this dissemination agency would need to draw on research monies for pilot and demonstration programs. The rationale for demonstration programs is the development of a critical mass of innovations within a given school system. The innovative program may project itself well beyond the public school system. The demonstration center becomes a showplace for other schools to view.

Obviously the selection of the demonstration centers, the competency of the personnel, and other factors will have much to do with how well the results of the program are accepted by other schools systems. Consequently, it becomes imperative that State leaders invest time and money in a program of continuous evaluation and dissemination of innovative efforts.

Almost by definition an instructional program in vocational-technical education must be tailored to the needs of the individual school system. Consequently, it becomes the responsibility of the staff in the local educational agency to determine what innovative approaches to vocational-technical education are appropriate for their system. This may require some expert analysis of current practices. It may be useful to involve individuals who are not intimately connected with the local school system in this analysis. It behooves a State educational organization to provide ways and means for local systems to undergo a review of their programs periodically. Perhaps this could be done by using State money to hire individuals from other local educational agencies to make on-site visits

for review purposes. Probably such an appraisal also could be enhanced by a systematic reporting system which focuses on outcomes of programs such as the degree and extent of student placement in jobs rather than on process variables such as teaching methods or average daily attendance data. In any event, it appears likely that local education agencies will need much assistance from state-level agencies in carrying out a systematic review and program analysis.

State-Level Priorities for Research and Development

Participants at the National Conference on Research suggested the following areas as critical problem areas for most States:

1. The methodology of curriculum development.
2. The formation of broad manpower policies.
3. The relative efficiency of various organizational structures for providing occupational education.
4. Building curricula for the disadvantaged.
5. Teacher education processes.
6. Student selection procedures and devices.
7. The development of an information system which will keep practicing teachers up to date.
8. The indexing of staff and personnel throughout the State who are compentent in research techniques.
9. The extent of vocational education in the private sector.

The Training of Researchers

One of the potential major mistakes which could be made by State decision-makers is the assumption that research processes can be institutionalized into existing systems without training for research competency. There is insufficient time to wait for "finished products" from colleges or universities. State staff personnel must be trained to attend to data processing and collection. This requires a commitment of time and money from State and local sources. People in positions as change agents must be prepared to identify needs in the present system. They must be equipped to assist practitioners in solving some of the identified needs.

The object of the training function is to recruit, train, and develop manpower necessary to undertake research processes. This function is different from dissemination of information. In fact, it may be necessary to train the disseminators of information. Logically, it appears the agency to do research training would be a group removed from the hustle and bustle which characterizes everyday activities of a State department of education. Usually, expertise in research and development may be found in university settings. It is recommended contracts be written with university or college educational agencies for the training of staff in research processes.

The development of research literacy not only among State staff but among consumers of the findings will pave the way psychologically for educational change. One of the primary targets for research training may be the State staff itself, particularly the staff in teacher education. *The National Conference participants recommended research training for staff at all levels.* Workshops and seminars for local school systems staff could be held throughout the State to acquaint them with research procedures. Highly trained research and development personnel are in short supply in most States. Yet this training is essential to the success and functioning of research systems in the vocational-technical organization. Special attention must be given to the utilization of strength and capability in research wherever it exists.

Some functions involving research and development may be contracted to research personnel in colleges and universities. When these personnel become identified and available for such contract work, teams of experts may serve in answering local educational agency requests and in cataloging and making recommendations on research proposals. It is anticipated a reasonably large amount of intermittent contract work would be conducted with institutions in the State. This would cut down on the need for a large continuing staff in the State agency office. It should be noted that funds for the training of researchers are available from sources other than P.L. 90-576, notably the Education Professions Development Act.

Specific Recommendations

1. Every State should institute a multi-level technical information center equipped with access to national document collections and research tools. This center should be designated to respond to requests for data on school systems by local educational agency administrators.

2. When made available from the Center for Vocational and Technical Education, Ohio State University, the guide for establishment of the information system for the State should be used to insure compatibility with the national system.

3. The dissemination of information from the technical information center requires differential packaging for various user groups. The dissemination arm of the information center should be staffed using the concept of differential staffing.

4. The technical information system should be linked with those individuals in school systems who have primary responsibility for curriculum innovation and improved teaching practices.

5. Each research project which is funded should include a plan for dissemination of the results.

6. Local educational agency personnel should be involved in workshops, in-service training programs, and other activities to upgrade their proficiency in research techniques and in their ability to consume results of research studies.

7. Arrangements should be made with university educational agencies for the training of State staff, vocational teacher educators, and local practitioners in research processes.

8. Research instruction and the use of research findings should be an integral part of professional education courses on the undergraduate level or as part of courses for the certification of vocational teachers.

CHAPTER 4

Implications For National Research and Development

Guiding Principle

Coordination of research in vocational education continues to be the primary responsibility of the Division of Comprehensive and Vocational Education Research. The U. S. Office of Education remains the only agency in a position to minimize unnecessary duplication with 50 new funding decision points identified in the 1968 Amendments.

Nationally, one of the most critical priority areas appears to be the development of a common base for reporting information from State programs of vocational-technical education. Such a system would require the standardization of terminology. Immediate and reasonably comprehensive information disseminated to the States about research proposals which have been approved by State and national agencies could prevent duplication and overlap of research effort throughout the country.

The State is seen as a clearinghouse for channeling locally developed materials to the national system. However, it becomes a national responsibility to process this data in such a manner as to make it clearly and immediately available to users on a national basis. Several efforts at dissemination on a national and regional level have been noted. Among those are the Ohio State University Center's Ad Hoc Committee on Dissemination which developed a guide for the establishment of State information systems in vocational-technical education. Also on the regional basis a selective dissemination project has been initiated in the Tennessee Research Coordinating Unit. Coordination of research findings appears to be the number one problem. Participants at the National Conference on Research envisioned Research Coordinating Units' activities as a major factor in helping to bring about coordination and dissemination on a national scale. Some participants felt that local and State personnel should be represented on advisory groups to the U. S. Office of Education and the national centers.

As noted in the committee hearings, there appears to be some evidence

of a lack of cooperation between the research division and the operating division of USOE. It is recommended that a position in the Division of Comprehensive and Vocational Education Research be maintained for the purpose of providing liaison, promoting cooperation, and assuring voluntary coordination among the States and between them and the Bureau of Research. At the same time conventional wisdom would suggest a rigid separation of functions and a careful elimination of duplication between these two offices. Agencies that have remained virile and have avoided deterioration have done so in part by friendly stepping on each other's toes. In short, when there is a large need or opportunity at stake, it is profitable and appropriate to employ both competition and careful planning.

There is need for more of a systems analysis through all levels of government. Specifically, the analysis should be tied to the decision-making function and the opportunity for creative thinking by a large number of people without undue concern for technique or methodology.

The House Subcommittee on Education and Labor, U. S. Congress, expressed some concern with the low priority assigned to vocational education in the Office of Education. Included in this concern was the small number of budgeted supergrades assigned to vocational-technical education and the void of staff from any field of vocational-technical education to assist with the administration of the Education Professions Development Act.

While virtually all of the public elementary and secondary education is controlled at the State and local level, it makes little sense for the research and development projects to be completed for purely local reasons. Consequently, an additional burden is placed on national or regional centers. Through national distribution systems visibility may be given to appropriate research results. It makes sense therefore for research analysis and synthesis to be conducted primarily at the regional and national centers and within the confines of the USOE.

Eventually such an approach should be developed in the area of curriculum materials and other teaching and learning aids for vocational-technical education. There is no reason for the bulk of these materials to be developed within local school systems or even within State educational agencies. If the content is sufficiently broad to be taught throughout any given State, more than likely the content is generalizable to vocational-technical education as a whole throughout the nation. The participants at the conference could foresee a national materials laboratory with the machinery designed to solicit contributions from States and then to make available at a minimal cost learning aids for local vocational-technical programs. Such a system may be beyond the scope of research but includes the development of vocational-technical programs.

Specific Recommendations

1. Basic research in vocational-technical education should be funded primarily at the national and regional levels.

2. Federal guidelines should include not only the dates project proposals are due but the dates new grants become available as well.

3. Users of research should be involved at all levels in advisory capacities to USOE.

4. USOE should establish "request" channels of communication with States. Priority problems encountered by States should be called to the attention of Federal agencies.

5. A channel of communications should be established to permit a State or a consortium of States to influence the schedule of research undertaken by national research agencies and/or the funding priorities of USOE.

6. A position in the Division of Comprehensive and Vocational Education Research should be maintained for the purpose of providing liaison, promoting cooperation, and assuring voluntary coordination among the States and between them and the Bureau of Research.

7. Some agency in USOE, probably the position which coordinates activities of the Research Coordinating Units, should publish a monthly report of resumes of each State research project funded during the preceding month. Distribution should be to the State research agencies.

8. The Bureau of Research should consult with the State directors and the State research agency when considering support of vocational research within a particular State.

9. USOE should provide information to the States relative to the availability of research funds for vocational education under other agencies and Acts.

10. Development of curriculum materials and teaching aids based on research results should be funded at the national and regional levels.

11. USOE should investigate the possibility of using producers of educational materials as a means of disseminating ideas into the classroom.

APPENDIX A

Checklist for State Plan Research Provisions

— 1. Provision has been made for the use of funds allotted to the States for the purposes of Part C of the Act.

— 2. Experimental, developmental, and pilot programs have been described and related to priority needs within the State.

— 3. An agency of the State has designated authority for operating a technical information system which will disseminate information derived from programs of research and demonstration in vocational education.

— 4. The establishment of a research coordination unit has been indicated; its staff and functions have been described.

— 5. Relationship between the research coordination unit and other State agencies, such as the State board for vocational-technical education, have been described.

— 6. Procedures for setting priorities for projects under Section 131 (b) of the Act have been described.

— 7. Review procedures, including criteria for evaluating research proposals for funds under Section 131 (b) of the Act, have been described.

— 8. An organizational chart indicating all State agencies with responsibilities for conducting programs of vocational education research and dissemination has been included in the State plan.

— 9. Procedures for submitting applications for grants and contracts under Part C of the Act have been described in the State plan.

—10. Policies and procedures for acting on applications for grants and contracts have been described in the State plan.

—11. The State plan provides the state board shall forward to the Commissioner a copy of the approved proposal within 15 days after the grant or contract was made.

—12. Procedures and techniques for dissemination of research findings and the initiation of developmental and pilot programs have been described in the State plan.

APPENDIX B

Suggested Procedures for Submitting And Funding Research Proposals

The following is a sample letter which might be used to solicit proposals and communicate State priorities to interested individuals:

To: Those who may be interested in submitting proposals in vocational-technical education research.

The State Department of Vocational and Technical Education is soliciting requests for research proposals which will be considered for funding for the fiscal year beginning July 1, 19___. The funds available for grants and contracts under Title I, Part C, Section 131b of the Vocational Education Amendments may be used for:

1. Research and Training Programs.
2. Experimental, developmental, or pilot programs developed to meet the special vocational needs of youths, particularly youth in economically depressed communities who have academic, socio-economic, or other handicaps that prevent them from succeeding in the regular vocational education programs.
3. The dissemination of information derived from the foregoing programs or from research and demonstrations in the field of vocational education, which programs and projects have been recommended by the State Research Coordination Unit or by the State Advisory Council.

Grants may be made to:

1. Colleges and universities.
2. Other public or non-profit private agencies and institutions.
3. Local educational agencies.

Approved proposals will be supported at 90 per centum of the costs of the programs and projects.

Top priorities will be given to:

1. (List those priorities which are to be given particular
2. emphasis in the State for the current fiscal year.)

Other priority areas are:

1. (List the remaining State priorities.)
2.

In addition, funding will be considered for other particularly innovative projects regardless of their relation to listed priorities.

The procedure followed by the State Department in the funding of projects and programs of research will be as follows:

1. All proposal summaries will be acknowledged.
2. A review committee of Department personnel will evaluate all submitted summaries.
3. Those summaries judged to have the best innovative and generalizable research possibilities will be selected for further description. All applicants will be notified of the disposition of their summaries.
4. The initiators of the selected summaries will be notified and a complete set of guidelines and budget forms will be forwarded to them. Research Coordinating Unit personnel will be available for consultation in the preparation of the proposal.
5. When a complete proposal is submitted, it will be evaluated by a committee selected for expertise in the area of the proposal. The Director of the RCU will forward the evaluation and his recommendation to the State Director.
6. The State Director will make final determination regarding funding of proposals. He will notify the sponsoring institution of the award, with copies of the notification to the principal investigator and the RCU.
7. All those submitting proposals will receive notification of acceptance or rejection.
8. Within ten days of notification of approval, a grant document containing budget amounts, method and schedule of payment, reporting requirements, and special conditions will be negotiated by the State Department and the

sponsoring institution. A project manager from the staff of the RCU will be named to act as liaison during the fiscal year.

Proposals will be evaluated and recommended for approval according to the following criteria:

1. Educational Significance.
   a. Does the proposal address itself to needed improvements in vocational education?
   b. Is there a sound theoretical and logical basis for this approach to solution of the problem?
   c. Can anticipated results be generalized to more than one situation?
2. Soundness of design, procedure, or plan.
   a. Are the problems or objectives clearly stated?
   b. Do the procedures show logical and sequential steps with enough detail to indicate the investigators' ability to relate procedures to problems and objectives with expection of successful results?
3. Adequacy of personnel and facilities.
   a. Do personnel have professional competence to carry out the project or program?
   b. Does the applicant organization have the necessary facilities to carry out the project?
4. Economic feasibility and efficiency.
   a. Can the objectives be accomplished within the stated budget?
   b. What are the relationships between cost, expected outcomes, and importance of the problem?
5. Other specific criteria as appropriate. (To be designated, e.g., in the case of requested proposals)

PROPOSAL SUMMARY FORM

DIRECTIONS: Complete all areas of this form and return by_____ to:

Proposal Summary
Director, Research Coordinating Unit
(State Address)

Please Type

Proposed Title:_____

_____

Brief Description (maximum 250 words): to include:

1. A statement of the problem.
2. The procedures and personnel involved.
3. Expected outcomes.
4. Approximate cost.

CONTINUE ON REVERSE SIDE

FROM: _____
Name Department

_____
Agency Title

_____
Street Address City

_____
Zip Code Phone & Extension

_____
Signature

Space Below for Office Use Only

PROPOSAL FORMAT

The format should be adapted to the activity, but the proposal should contain, in general, the following items. An asterisk indicates that the item *must* be included.

*I. Title Page (format developed by the individual State)

*II. The Abstract

*III. The Body of the Proposal

A. Problem and Objectives

*1. Statement of the specific problem in vocational or technical education with which the research is concerned.

*2. Statement of the objectives of this particular project.

3. Rationale of the Study

a. A brief description of the findings of previous or related research and uses to be made of those findings in the research now being proposed.

*b. Preliminary investigations or previous research in the proposed subject by the applicant, and persons who have been consulted regarding this proposal.

B. Use to be made of findings.

*1. Statement of the need for this research by vocational-technical educators, and what use will be made of the additional data gained.

*2. Relevance of the proposed research to annual and long-range State Plans for Vocational-Technical Education.

C. Description of Activities

1. A list of procedures in chronological order through which the objectives are to be achieved.

*2. Duration of the proposed project.

IV. Personnel and Facilities

*A. Education and experience qualifications of the principal investigator and other professional staff.

B. Identification and description of the facilities to be used.

*V. Budget Section

A. Estimated cost of the project divided into major categories, e.g., personnel, supplies, equipment, travel, communication.

B. Additional support to be contributed to the project from other sources.

VI. Appended Items — such as letters of agreement with cooperating agencies.

APPENDIX C

Examples of Research Coordinating Activities
Source: Florida State Department of Education

It will be necessary for the RCU to engage in activities with personnel from local school systems, State universities, the Division of Vocational, Technical, and Adult Education, the U. S. Office of Education, and other agencies and organizations. The following list contains activities common to the educational level indicated; it is not intended to be an exhaustive list. Also, there will be an overlap of activities among educational agencies.

Local School Systems

Members of the RCU staff are available to help in:

1. Defining research problems and preparing proposals.
2. Developing research project applications.
3. Evaluating research project applications prior to submitting them to the Division or to the USOE.
4. Developing and administering data-gathering instruments.
5. Tabulating, summarizing data and information gathered for use in research projects.
6. Identifying consultants for research projects.
7. Supplying recent research findings and suggested uses of those findings.
8. Planning and directing activities designed to develop research competency.
9. Conducting training sessions in the use of complete educational research materials stored in the Division office.

Universities

The RCU can assist universities by:

1. Distributing findings of research studies relating to vocational, technical, and adult education.
2. Funding graduate assistantships in vocational-technical education research.
3. Assessing the value of research proposals to vocational, technical, and adult programs.
4. Assisting in recruiting and training researchers in vocational, technical, and adult education.
5. Keeping research and teacher education personnel informed of problems needing study.

Division of Vocational, Technical and Adult Education

The RCU can assist the Division by:

1. Abstracting and distributing completed research findings to interested persons.
2. Conducting in-service training programs for persons interested in developing research competencies.
3. Developing long-term research plans.
4. Maintaining an index of research in progress and a library of completed vocational-technical research.
5. Developing guidelines for field testing promising innovative programs, demonstration programs, and other research activities for improving vocational education.
6. Conducting, or assisting in conducting, research projects assigned by the Division of Vocational, Technical and Adult Education.

U. S. Office of Education and National Research Centers

The RCU can assist the USOE and National Centers by:

1. Reviewing and evaluating research proposals from local education centers before they are sent to the USOE for review and possible funding.
2. Reviewing and evaluating selected research projects submitted to the USOE.
3. Cooperating in certain aspects of broad research projects having regional or national significance.
4. Cooperating in nation-wide acquisition and distribution of completed vocational research.

Other Interested Agencies

The RCU can assist other agencies interested in research by:

1. Assessing research proposals.
2. Assisting in the development of research instruments.

APPENDIX D

Example of Research Coordinating Unit Budget

TABLE I

Program Budget: Research Coordination Unit

Item	FY '71 Total	FY '71 Fed.	FY '71 State	FY '72 Total	FY '72 Fed.	FY '72 State	FY '73 Fed.
I. Function: Stimulation — Facilitation — Coordination							
A. Activity: Technical Consultation; Project Review							
1. Personnel							
a. Researcher (25% over 36 mos. @ $16,000/yr.)	$4000	$3000	$1000	$4000	$3000	$1000	$4000
b. Clerical (10% over 36 mos. @ $5,000/yr.)	500	375	125	500	375	125	500
2. Benefits (10% of salaries)	450	338	112	450	338	112	450
3. Indirect costs (20% of salaries)	900	675	225	900	675	225	900
4. General operating (10% of total)	585	414	171	585	414	171	585
*5. Travel of Review Committee	840	756	84	840	756	84	840
*6. Conference facilities	120	108	12	120	108	12	120
Sub-total	$7395	$5666	$1729	$7395	$5666	$1729	$7395
B. Brochure: "Application Procedures for Research Funds"							
1. Personnel							
a. Researcher (1% over 12 mos. @ $16,000/yr.)	160	120	40				
b. Clerical (½% over 12 mos. @ $5,000/yr.)	25	19	6				
2. Benefits (10% of salaries)	19	14	5				
3. Indirect costs (20% of salaries)	41	31	10				
4. General operating (10% of total)	25	19	6				
*5. Duplicating	700	630	70				
*6. Addressing and mailing	100	90	10				
Sub-total	$1070	$ 923	$ 147				
C. Study: "Assessing Research Resources"							
1. Personnel							
a. Researcher (20% of 12 mos. @ $17,000/yr.)				$3400	$2550	$ 850	

* 90% Federal reimbursement.

TABLE II

Program Budget: Solicited and Unsolicited Individual Projects

	FY '71	FY '72	FY '73	FY '74	FY '75
Est. total funds available to state	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
*Est. total funds allocated to organization operation	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
Est. net funds available for individual projects	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX
I. SOLICITED					
A. Continuing Activities					
1. Name of function: Name of activity	XXXX	XXXX	XXXX	XXXX	
2. Name of function: Name of activity	XXXX	XXXX			
B. New Activities					
1. Name of function: Activity or problem	(XXXX)**	(XXXX)			
2. Name of function: Activity or problem		(XXXX)	(XXXX)	(XXXX)	
II. EARMARKED					
A. Continuing Activities					
1. Name of function: Name of activity	XXXX	XXXX	XXXX		
B. New Activities Areas (by priority)					
1. Name of function: Activity or problem area	(XXXX)	(XXXX)	(XXXX)	(XXXX)	(XXXX)
2. Name of function: Activity or problem area	(XXXX)	(XXXX)	(XXXX)	(XXXX)	(XXXX)
3. Name of function: Activity or problem area	(XXXX)	(XXXX)	(XXXX)	(XXXX)	(XXXX)
III. NON-EARMARKED					
A. Continuing Activities					
1. Name of function: Name of activity	XXXX	XXXX	XXXX		
B. New Activities Areas	(XXXX)	(XXXX)	(XXXX)	(XXXX)	(XXXX)
TOTALS	(XXXXXX)	(XXXXXX)	(XXXXXX)	(XXXXXX)	(XXXXXX)

*Taken from organizational budgets.
**(XXXX) indicates estimated allocated costs.

TABLE III
Program Budget: Research-Related Activities

	FY '71		FY '72		FY '73		FY '74
	Fed.	Other*	Fed.	Other	Fed.	Other	Fed.
I. FUNCTION: OPERATIONAL RESEARCH							
A. Program, Planning and Development							
1. Name of activity							
2. Name of activity							
B. Individual Projects							
1. Solicited: Name of activity							
2. Unsolicited: Name of problem area							
II. FUNCTION: NORMATIVE DEVELOPMENT							
A. Program, Planning and Development							
1. Name of activity							
B. Individual Projects							
1. Unsolicited: Name of problem area							
(Etc.)							
X. ADMINISTRATION AND SUPERVISION							
A. Program, Planning and Development							
B. Evaluation							
C. Research Coordinating Unit							
XI. UNEARMARKED							
TOTALS							

*Varying reimbursement rates would be applicable.